

**THE REORGANIZATION OF THE ACADEMIES OF SCIENCES OF THE  
FORMER SOVIET UNION WITH EMPHASIS ON THE UKRAINIAN ACADEMY**

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**ABSTRACT**

The Academies of Sciences of the new republics organized from the former Soviet Union (USSR) are reviewed for their current status and discipline interests. Some of the largest and oldest academic institutes in the world are found within the former USSR framework. These institutes include research laboratories, herbaria, and agricultural centers representing disciplines of the plant sciences. New institutes organized since the dissolution of the USSR are also included. Names of noted scientists are incorporated into the titles of some of these academic centers. All areas of science and engineering, including the botanical sciences, are briefly presented in this review of the Commonwealth of Independent States (CIS) Academies as they now exist.

**KEY WORDS:** USSR-CIS Academies of Sciences, laboratories, institutes, research centers, academic disciplines of the Academies, the Ukraine Academy

Since the recent formation of the independent republics, created out of the former Soviet Union, the Academies of Sciences facilities within each republic have continued to function independently. Laboratories, institutes, and research centers produce research projects with quality data from in-depth studies. Many thousands of professional and highly trained individuals are employed in these facilities. The majority of their findings are presented as journal articles, reports, lectures, and symposia within their institutes. Good working relations exist between the Soviet Academies and European based science organizations, particularly in Finland, Germany, and England. Academies are now organized within separate republics, utilizing the previous Soviet Union administrative and scientific personnel. Since the formation of the republics, the Academies have actually expanded their operations and academic disciplines. There is also a newly organized Russian Academy of Sciences

housed in new Moscow facilities intended for use by the entire former USSR Academies of Sciences (Figure 1). Individual Academies are examined according to their research specialties in the new republics with emphasis given to the detailed structure of the Academy of Sciences of the Ukraine.

Prior to the formation of the independent republics, the headquarters for all institutes, sections, and laboratories of the Academy of Sciences of the Soviet Union was Moscow. One Academy existed with many individual and corresponding members located throughout the previous Soviet Union. The central offices for the Soviet Union were housed in the former palace and support building used by Napoleon on his march through central Europe (Figure 2). A new Academy building was constructed in Moscow to house the central offices of the ever expanding institutes and research facilities of the Soviet Union (Figure 3). This building brings to the Moscow skyline an ultra modern multisection structure of an architectural design unique to Moscow (Figure 4). Completed just before the Soviet dissolution, the new building complex was constructed near the Yuri Alekseyevich Gagarin Memorial and the Gagarin Plaza. With the dissolution of the Soviet Union, the new building now is headquarters for the reorganized Russian Academy of Sciences. Also included in the building are conference rooms, reception halls, and auditoriums in addition to administrative office suites for science, cultural, and engineering disciplines.

Now the republics have independent Academies of Sciences and corresponding administrative offices. The independent Academies of Sciences and capital cities include the Academies of Azerbaijan (Baku), Armenia (Yerevan), Belarus (Minsk), Estonia (Tallinn), Georgia (Tbilisi), Kazakhstan (Alma-Ata), Krgyzstan (Bishkek), Latvia (Riga), Lithuania (Vilnius), Moldova (Kishinyov), Russia (Moscow), Tajikistan (Dushanbe), Turkmenistan (Ashkhabad), Uzbekistan (Tashkent), and the Far East and Ural Scientific Center Section in addition to the Ukraine (Kiev).

The Academy of Sciences of Azerbaijan was founded in the capital city Baku in 1945 on the basis of the Azerbaijan Branch of the Academy of Sciences of the USSR. The Academy has 47 full members and 46 corresponding members that comprise the voting personnel found in five sections and 30 scientific establishments and facilities. Noted areas of specialization include mathematics, hydrodynamics, physics of semiconductors, electrophysics, the chemistry of oil, geology, physiology, biochemistry, and other closely related fields, with the biological sciences receiving less attention.

The Academy of Sciences of Armenia was founded in 1943 in Yerevan. Individual membership includes 40 members with 50 corresponding members and three foreign members in six sections and 30 scientific establishments. Noted scientific disciplines include mathematics, cybernetics, astrophysics, mechanics of solid bodies, geology, seismology, the chemistry of natural and synthetic compounds, biochemistry, and archaeology.

The Academy of Sciences of Belarus with headquarters in Minsk was organized in 1928 on the basis of the Belarus culture. The organization was initiated with nine research institutes and three independent labs. After World War II (the Great Patriotic War), many scientific enterprises were developed and incorporated into the Academy. There are approximately 53 members, 75 corresponding members in five branches and 32 scientific establishments. Scientific disciplines of particular note include solid physics, high temperature optics physics, nuclear engineering, computer devices,

cybernetics, radiobiology and photosynthesis, economics, philosophy, and linguistics.

The Academy of Sciences of Estonia was founded in 1946, after the Great Patriotic War. The Academy has 21 members, 24 corresponding members, and ten research establishments. The complex use of slate fuel is a major research discipline of study.

In the city of Tbilisi, the Academy of Sciences of Georgia was founded in 1941. There are 63 academy members, 69 corresponding members in nine sections and 41 scientific establishments. Over 1000 scientific topics and 234 science problems are under study.

The city of Alma-Ata was the founding location for the Academy of Sciences of Kazakhstan in 1946. There are 53 members of the Academy, 85 corresponding members with five branches, 42 research establishments, and sixteen institutes. With a staff of over 1800 members, 48 hold Ph.D. degrees, 238 M.S. degrees, 200 assistants, and over 200 are graduates of the institutes.

In Bishkek the Academy of Sciences of Kyrgyzstan was organized in 1954. A total of 26 members and 32 corresponding members form the entire membership. Five sections and seventeen scientific establishments are found in the Kyrgyzstan Academy. Trends of study in the Academy include developmental geology, physics, and geochemistry of mountain rocks.

The Academy of Sciences of Latvia was organized in Riga in 1946. The Latvia Academy has 25 academy members and 31 corresponding members. There are three sections and fifteen scientific establishments. The guidelines of the Academy examine the national economy and the culture of the republic.

The Academy of Sciences of Lithuania was founded in Vilnius in 1941, and restored in 1946. The Academy now has 23 members and 25 corresponding members in three branches and twelve scientific establishments. Research trends include theories of probabilities, statistics, problems of cybernetics, theoretical spectroscopy of atoms and molecules, physics of semi-conductors, high temperature heat physics, metal coatings, and galvanic covers with previously set properties. Biological principles to increase plant growth along with economics are under study as are the disciplines of history, languages, and literature.

The Academy of Sciences of Moldova was founded in 1961 in Kishinyov. The eighteen members and 26 corresponding members are found in three branches and seventeen scientific establishments. The primary research trends are directed to solving problems of agriculture to increase production. The history and culture of Moldova are also under study.

The Academy of Sciences of Russia was reorganized in 1991. First founded in 1917, then in 1925, the organization was expanded into the Academy of Sciences of the U.S.S.R. Before 1917, the group was known as the St. Petersburg Academy of Sciences which was initially founded in 1724. From 1934 to 1991 the Academy was housed in Moscow. There are approximately 269 members, 536 corresponding members, and 77 foreign members.

The U.S.S.R. Academy of Sciences had several sections. These sections included mathematics, general physics and astronomy, nuclear physics, physico-mechanical problems of mechanical engineering, mechanics and process of management, general and technical chemistry, physicochemistry and technology of inorganic materials, biochemistry, biophysics, and chemistry of biologically active compounds, physiology, general biology, geology, geophysics and geochemistry, oceanology, physics of the atmosphere, geography, history, philosophy and law, economics, literature, and language.

The Soviet complex included 250 scientific establishments, with about 42,000 science workers, 200 scientific councils, and a research fleet. It coordinated the activities of the Academy of Sciences of the Union Republics. The complex trained the research staff. Included were 16,500 postgraduates located throughout the Union Republics. Under the Union Republics, organized through Moscow, the Union Academies awarded medals and prizes for science works. Also coordinated through Moscow were a number of Science Societies within the Academy of Sciences of the former U.S.S.R. The Soviet Academy also handled scientific relations with 250 international organizations located in many countries.

The Academy of Sciences of Tajikistan was organized in 1951 in Dushanbe. The disciplines and sections of the Academy include mathematics, seismology, astrophysics, nuclear physics, chemical technology, biology as well as history and literature. The number of members in Tajikistan is not known.

The Academy of Sciences of Turkmenistan was organized in 1951 in Ashkhabad. Research specialties include molecular acoustics, spectroscopy, applied geophysics, petroleum chemistry, desert farming, cotton productivity, biochemistry of viruses as well as history of the area, languages, and literature. The number of members in Turkmenistan is not known.

The Academy of Sciences of Uzbekistan was founded in 1932 in Tashkent on the basis of a republic committee guided by the Soviet science establishments. Regular meetings and the Academy structure were developed by 1940. The number of members in Uzbekistan is not known. In addition, the Siberian section and the Far East and Ural Scientific Center contain eleven branches, including five in Siberia.

The Academy of Sciences of the Ukraine was founded in 1918 by a group in Kiev headed by Academician Vernadsky who served as the first president. Succeeding presidents included Acad. Vasilenko (1921-22), Acad. Levitsky (1922), Acad. Lipsky (1922-28), Acad. Zabolotny (1928-29), and Acad. Bogomoletz (1930-46). From 1946 to 1991 the Academy directorate was through offices in Moscow. Currently the Ukraine Academy has 83 Academy buildings or complexes, 87 organizations and departments, with 89,000 people working within the structure of the Academy. A total of 2096 people have earned their Ph.D. degrees, 10,336 have M.S. degrees, 10,003 people are professor - candidates of science, and 194 are academicians and 269 corresponding members of the Academy of Sciences. Of the 2096 Ph.D.'s 2050 work within the science establishments. Currently 54 foreign member belong to the Ukraine Academy.

The general management of the Ukraine Academy is structured for an office of the president, with a vice president, general science secretary, and assistant science secretary reporting to the president. The vice president's immediate staff includes a group manager, a special task group, a group for equipment computation and science instruments, and a group for plans, operations, and economics. In addition, special departments are designed to report directly to the president and vice president. The special departments include the Dept. of Science Organization, Dept. of Building, Dept. of International Regulations, and the Dept. of Applied Programs.

Major sections in the Ukraine Academy serve as the disciplinary areas of investigation and research. The areas of study evolved to fit the needs of the people and geographic location of the Ukraine. The research centers of the National Academy include the Innovation Center, Donetsk Research Center, West Research Center, South Research Center, North-Eastern Research Center, and the Research Center of the Dnieper Area. In comparing section topics between republics of the former Soviet Union, similarities are found when the Union was directed previously from Moscow. Additional disciplines identify the needs and requirements of a particular geographic location and more recently the requirements and ethnic background of a particular group of people. Frequently these divisions are also separated by a particular language and cultural heritage. The Academy of Sciences of the Ukraine strongly reflects these regional and ethnic characteristics and requirements.

The central departments of the Ukraine Presidium include Metrology, Standardization, and Quality Production Control, with an Experimental Plant of the Institute of Superhard Materials. The Center of Research and Teaching Foreign Languages is becoming more widely used with the creation of the CIS. Departments include Material and Technical Supply, and Scientific Equipment. The extensive Natural Science Museum houses Archaeology, Geology, Paleontology, Zoology, and Botany Museums and herbaria. The Science Exposition Center, Science Exhibition Center, and Intertrade Firm help promote science information as does the Laboratory of Scientific Cinema - Photoinformation, House of Scientists, the Association of Young Scientists and Specialists, and individuals in their respective disciplines.

Interdepartmental Research Councils in the Ukraine focus attention on Socioeconomic Prognostication, Economics, Increase of Safety and Longevity of Machines and Structures, Corrosion and Anticorrosive Protection of Metals, and Problems of National Relations. Other Councils focus on Automation of Experimental Studies, Experimental Instrument Making, Problems of Biosphere, Philosophical and Social Problems of Science and Engineering, Problems of Biotechnology, and the Automated Systems of Data and Computer Networks, Science Publications, Museum, Information - Library, and the Council on Mechanics and Technology of Explosion. Committees are organized for Slavonic Scholars, Studies and Expansion of Slavonic Cultures, the Program of UNESCO's Man and Biosphere, New and Regenerated Sources of Energy and Its Conservation, Chemical Problems, Scientific Terminology, Informatics, System Analysis, and the Committee of Science and Culture Relations with Ukrainians Abroad. Commissions include Space Research, Transport Development, World Oceans, Relations with the International Agency on Atomic Energy, Program on Goods and Services, Agricultural Sciences, Computer Engineering, Distribution and Use of Scientific Services and Installations,

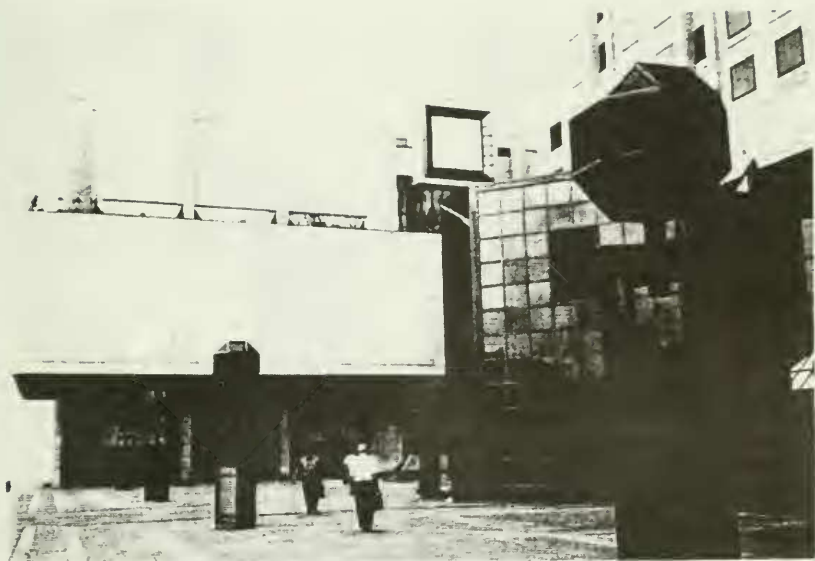


Fig. 1. Main entrance to the new Academy of Sciences of Russia in Moscow.



Fig. 2. Headquarters of the former Soviet Academy of Sciences, Moscow.

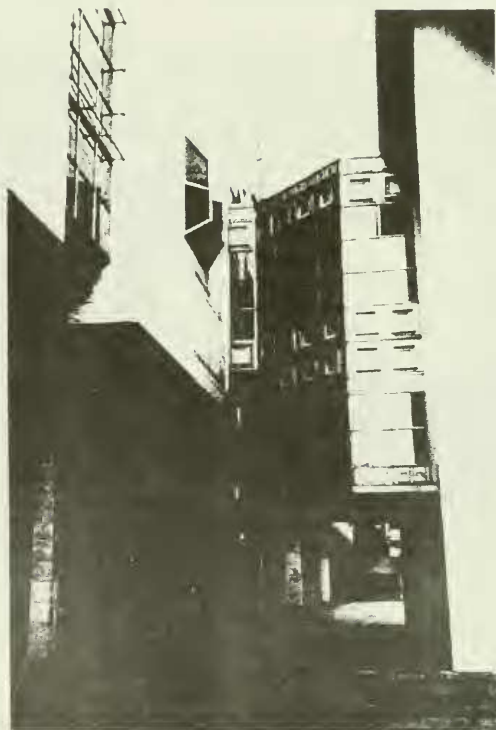


Fig. 3.

Complex of offices, lecture rooms and conference facilities at the Russian Academy of Sciences, Moscow.

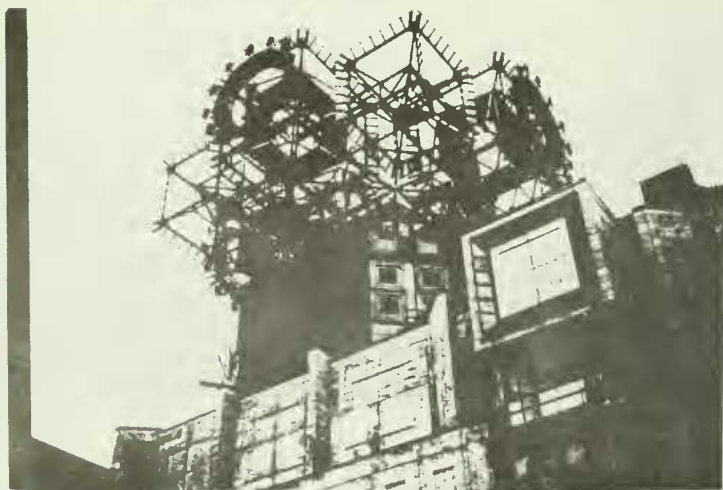


Fig. 4.

Art sculpture located on high rise office complex of the Russian Academy of Sciences, Moscow.

Acquirement of Archive Materials, Works of Art and Rare Publications, Youth Relations, Military Sponsorship, Science Historians, Awards for the Use of Inventions, and the Commission on Development of Scientific Inheritance.

In addition to the Presidium organization, two major sections compose the National Academy of Sciences of the Ukraine. Centers, Institutes, Bureaus, and Associations are established in Section I, the Mathematics section of the Academy. Institute disciplines include Applied Problems of Mathematics and Mechanics, Low Temperatures, while Mathematical Societies exist in Kharkiv, Kiev, Lviv, and Donetsk. A total of eleven sections are found in Section I. Internationally recognized people honored with their names incorporated into the Institute names in Section I include Ya. S. Pidstrygach (Applied Math. and Mechanics), and B.I. Verkin (Low Temperatures).

Section II includes Science Information, Computer Engineering, and Automation. Twelve establishments in Section II include Cybernetics, Timer Computers, Aerospace Information of Ecological Monitoring, Automated Biotechnical Systems, Problems of Calculating Machines and Systems, Program Systems, Problems of Record Information, Science and Technology Potential, Applied Information, Technology of Programming, Problems of Artificial Intelligence, Automation, Experimental Production Amalgamation, Informatics and Control, and Problems of Cybernetics. Institutes so honored by names of scientists include V.M. Glushkov (Cybernetics) and G.M. Dobrov (History of Science).

Mechanics Institutes are found in Section III of the Academy complex. The Institutes include Design Technology, Technical Mechanics, Problems of Strength, Geotechnical Mechanics, Physicotechnical Problems of Transport on Superconducting Magnets, Hydromechanics, and Deformed Solid Body Mechanics.

Twenty three Institutes, Pilot Plants or Research Centers are within Section IV Physics and Astronomy. Major facilities include Nuclear Physics, Semiconductors, Metal Physics, Theoretical Physics, Low Temperature Physics, Radiophysics and Electronics, Radioastronomy, the Ionosphere, Condensed Systems, Applied Physics, Electron Physics, Electrophysical Treatment, Solid Body Physics, Quantum Electronics, Astronomy, Plasma Electronics, and Acceleration of Charged Particles.

Eight Institutes and Pilot Plants are housed in Section V Earth Sciences. They include Geological Sciences, Marine Geology, Geophysics, Geodynamics of Explosion, Geography, Geochemistry, Mineralogy and Ore Formation, Fossil Fuels, Nature Conservancy, Marine Hydrophysics, and Natural Shelf Resources. Councils and Committees are on Geophysics, Meteorites, Lithology, Mineralogy, Paleontology, Hydrogeology, Natural Resources - Remote Sensing, Mineral Resources, Tectonics, Fossil Fuels, and Earthquakes. An Institute is named in honor of S.E. Subbotin (Geophysics).

Physical and Technical Problems of Materials Sciences compose the Institutes of Section VI. The Institutes and Pilot Plants include Electrical Welding, Metal Treatment, Welding Materials, Electrometallurgy, Material Science Problems, Basalt Fibers, Materials Science Steels, Materials Science Problems, Casting Problems, Corrosion Mechanics, Superhard Materials, Pulse Processes and Technologies, Single Crystals, Thermoelectrics, and Ferrous Metallurgy. The Councils focus attention on



Problems of Superficial Phenomena in Melts and Solid Phases, Physical and Chemical Mechanics of Materials, and Problems in High Pressures in Materials Science. Institutes to honor scientists in Section VI include E.O. Paton (Electrical Welding), I.M. Frantsevich (Materials Science), G.V. Karpenko (Physical and Mechanical Science), V.M. Bakul (Super Hard Materials), and Z.I. Nekrasov (Ferrous Metallurgy).

Section VII of the Academy contains Institutes and Pilot Plants in Physical and Technical Problems of Power Engineering. Disciplines of Institutes, Pilot Plants, Bureaus, and Councils include Thermal Physics, Mechanical Engineering, Electrodynamics, Simulation Problems in Power Engineering, Energy Conservation, High Temperature Transformation, Gas, Steam Engines, Low Grade Fuels, and Mining Thermal Physics.

Section VIII Institutes, Pilot Plants, and Councils of the Academy involve disciplines of Chemistry. The designated areas of chemistry are Physical Chemistry, Technology of Fossil Fuels, Organic Chemistry, High Molecular Weight Compounds, Carbon Chemistry, Colloid Chemistry and Chemistry of Water, Surface Chemistry, Bio-organic Chemistry, and Petroleum Chemistry, Sorption and Problems of Endoecology, Drugs and the Ministry of Health, and Biocolloid Chemistry. Scientific Councils are organized to examine the Problems in Chemical Kinetics and Structure, Electrochemical Kinetics and Electrode Processes, Synthesis and Ultrapurification of Inorganic Compounds, Modification of Polymers, Technology of Surface Modification, Biopolymers and Bioregulators, and Petroleum Chemistry and Refining. Institutes in Section VIII bearing names of noted chemists include L.V. Pizarzhovsky (Physical Chemistry), O.V. Bogatsky (Physical Chemistry), L.M. Litvinenko (Organic Chemistry), and A.V. Dumansky (Colloid Chemistry).

Section IX Biochemistry, Physiology, and Molecular Biology contains institutes in these three disciplines in addition to Microbiology and Virology, and Cryobiology and Cryomedicine along with five Scientific Councils in Problems in these study areas. Institutes named for noted scientists include O.V. Paladin (Biochemistry), O.O. Bogomolets (Physiology), D.K. Zabolotny (Microbiology and Virology), and I.P. Pavlov (Physiology).

Section X Problems in Medicine is organized into Institutes, Bureaus, Hospitals, and facilities for making instruments and equipment. Institutes include Experimental Pathology, Oncology and Radiobiology, Labor Medicine, Neurosurgery, Urology and Nephrology, Endocrinology and Metabolism, Radiation Medicine, Epidemiology and Radiation Damages Treatment, and Food Chemistry and Technology. Two Councils examine Problems in Malignant Tumors and Deterioration. A scientist professionally recognized in Section X with an Institute name is R.E. Kavetsky (Pathology, Oncology, and Radiobiology).

The vast Section XI on General Biology houses Institutes, Botanical Gardens, Natural Reserves, Museums, and Societies that define the different regions and various habitats of the land. Institutes include Botany, Carpathian Ecology, Zoology, Hydrobiology, Plant Physiology and Genetics, and Biology of the Southern Seas. Natural Reserves, Museums, and Science Societies are found throughout the country, specializing in many disciplines. Science Councils focus on Problems in Ecological Prognostication under conditions of Intensive Conservancy, and Animal

Conservancy. Scientists elevated to Institute Recognition in Section XI include M.G. Kholodny (Botany), M.M. Gryshko (Botany), I.I. Schmalhausen (Zoology), and O.O. Kovalevsky (Tropical Biology).

Section XII Economics includes institutes in Economics, Problems of Markets and Economicoecological Research, Industrial Economics, Economicolegisative Research, Economics and International Relations, and Economical Programs. Councils exist to Investigate Production, Population Employment of Job Markets, Problems of Economic Relations and Improvement of Economic Mechanism, and Improvement of Planning and Social Production Control.

Section XIII includes History, Philosophy, and Law. Institutes of the Section include Ukraine History, Archaeology, Ukraine Science, Science of the East, National Relations and Political Science, Philosophy, Sociology, and the State and Law. Various Centers, Museums, Libraries, and Associations are found throughout the country. Councils focus attention on Problems in History of Science, Sociology, Coordination of Legislative Research, and Archaeology and Ancient History.

Section XIV concerns Literature, Language, and Art. Institutes include Literature of the Ukraine, Linguistics, Ukrainian Language, Art Study, Folklore and Ethnography, and Peoples Science. Councils study Scientific Terminology, Classical Inheritance and Fiction of the Present, Regularities in Development of Languages and Practice of Linguistic Activity, Artistic and Traditional Everyday Culture, the School of Ukrainistics, and the Ukrainian Onomastic Commission. Institutes with names of prominent individuals include T.H. Shevchenko (Literature), O.O. Potebnya (Linguistics), and M.T. Rylsky (Art).

Internationally recognized scholars are honored by having their names attached to the various Institutes. A time of transition is now underway with all Institutes under the former direction of central Academy control in Moscow. Now the Academy in Moscow is the directive for Russia, and Commonwealth States have independent jurisdiction for each new commonwealth republic. New associations replace the Soviet system, but as one nation dissolved into many, the entire fabric of the new republics must be built that incorporates the traditions, customs, and languages of the regions of the former U.S.S.R. International trade is suddenly crippled, and new economies and associations must be fostered. Central government funding, salaries, equipment, and supplies now are shifted to the private sector, international foundations, and associations. During this transition, the Institutes with their staff members remain available to supervise and guide the transition to individual Commonwealth States, a stabilizing factor for nationality expression. Every procedure, new invention, method, and association is now a new experience in an entirely new set of values and in an entirely new way of life which has no infrastructure to replace the old Soviet system.